



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,269	11/17/2003	Kousuke Suzuki	108946.01	1481
25944	7590	08/09/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			KIM, PETER B	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/713,269

Applicant(s)

SUZUKI, KOUSUKE

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15, 18, 20-27, 29-36 and 39 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 1-15, 18, 20, 23-27, 29, 32, 33, 35, 36 and 39 is/are allowed.  
6) ☒ Claim(s) 21, 22, 31 and 34 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09/787,364.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Applicant's arguments filed on June 16, 2005 have been fully considered.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 30, and 31 are rejected under 35 U.S.C. 102(a) as being anticipated by Shinonaga et al. (Shinonaga) (5,838,426).

Shinonaga discloses an exposure method using a projection exposure apparatus for illuminating a pattern on a mask (1) by an illumination light and projecting an image of the pattern onto a substrate (9) comprising a illumination optical system (27, 28, 29), a projection optical system (7), wavelength adjusting device (32), an image formation characteristic measurement system (col. 10, lines 43-60, detecting changes in focusing). A control system (ref. 15, 13, 17, 31, 32, 16, 22, 18, 14, 19, 20, 21), connected to the wavelength adjusting device and the image formation characteristics measurement system (Fig. 1), changing at least one condition of illumination condition by changing a wavelength of illumination light for illuminating the pattern on the first surface (1) (col. 6, lines 13-39), and detecting a change amount of image formation characteristics of an image projected on to the second surface (9) via the projection optical system (7) (col. 10, lines 43-60), detecting changes in focusing). Shinonaga discloses an installation environment measuring system for measuring and determining a change amount of the environment (22, 19, 21, 20), and changing a wavelength of the illumination light

Art Unit: 2851

according to the change amount installation environment (col. 9, lines 25-55). Besides the first technique for adjusting the image formation characteristics by changing the wavelength, Shinonaga also teaches changing the image formation characteristics (change in focusing) by correcting the focus position of the wafer (col. 10, lines 48-60). Shinonaga discloses in col. 4, line 57 – col. 6, line 29, the preparation operation for projecting the image of the pattern. Shinonaga also discloses the method and the apparatus wherein the change amount of the environment is the difference between the measure and reference environment (col. 10, lines 61-67), and the change amount of the image formation characteristics is caused by change in wavelength (col. 10, lines 48-60). Shinonaga also discloses the projection optical system made of plurality of glass (col. 11, lines 64-67), and providing gas supplied inside the projection optical system and the change in environment is the change of atmospheric pressure (col. 9, lines 7-62).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 22, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinonaga et al. (Shinonaga) (5,838,426).

Shinonaga discloses an exposure method using a projection exposure apparatus for illuminating a pattern on a mask (1) by an illumination light and projecting an image of the pattern onto a substrate (9) comprising a illumination optical system (27, 28, 29), a projection optical system (7), wavelength adjusting device (32), an image formation

Art Unit: 2851

characteristic measurement system (col. 10, lines 43-60, detecting changes in focusing). A control system (ref. 15, 13, 17, 31, 32, 16, 22, 18, 14, 19, 20, 21), connected to the wavelength adjusting device and the image formation characteristics measurement system (Fig. 1), changing at least one condition of illumination condition by changing a wavelength of illumination light for illuminating the pattern on the first surface (1) (col. 6, lines 13-39), and detecting a change amount of image formation characteristics of an image projected on to the second surface (9) via the projection optical system (7) (col. 10, lines 43-60), detecting changes in focusing). Shinonaga discloses an installation environment measuring system for measuring and determining a change amount of the environment (22, 19, 21, 20), and changing a wavelength of the illumination light according to the change amount installation environment (col. 9, lines 25-55). Besides the first technique for adjusting the image formation characteristics by changing the wavelength, Shinonaga also teaches changing the image formation characteristics (change in focusing) by correcting the focus position of the wafer (col. 10, lines 48-60). Shinonaga discloses in col. 4, line 57 – col. 6, line 29, the preparation operation for projecting the image of the pattern. Shinonaga also discloses the method and the apparatus wherein the change amount of the environment is the difference between the measure and reference environment (col. 10, lines 61-67), and the change amount of the image formation characteristics is caused by change in wavelength (col. 10, lines 48-60). Shinonaga also discloses the projection optical system made of plurality of glass (col. 11, lines 64-67), and providing gas supplied inside the projection optical system and the change in environment is the change of atmospheric pressure (col. 9, lines 7-62).

Although Shinonaga does not explicitly disclose changing a wavelength at each exposure shot or while the projection exposure apparatus is executing a predetermined preparation operation, which is an operation for changing the pattern of the mask or an operation for changing an aperture diaphragm, Shinonaga discloses changing a wavelength of the illumination light according to the change amount installation environment, and that the pressure measurement is performed every time wafers to be processed are loaded. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to change wavelength when the pattern of the mask is changed because when the pattern of the mask is changed a new wafer is also loaded.

***Allowable Subject Matter***

Claims 1-15, 18, 20, 23-27, 29, 32, 33, 35, 36, and 39 are allowed.

None of the prior art of record teaches or discloses controlling the formation characteristics measurement to system to measure a change amount of the image formation characteristics while changing the wavelength and determining a predetermined relationship between a change amount of the installation environment of the projection optical system and the change amount of the image formation characteristics based on the measurement results for the each condition.

None of the prior art of record teaches or discloses an exposure method or apparatus with a first and second image formation characteristic adjustment where the second technique is applied when the first technique could not completely make the correction or when the change amount of the change in the environment is greater than a predetermined value.

### ***Response to Arguments***

Applicant argues that Shinonaga does not teach changing a wavelength while the apparatus is executing a changing the pattern of the mask. Shinonaga teaches that pressure is measured and the wavelength is adjusted when a wafer is loaded. Since, a new wafer is loaded when the mask pattern is changed, Shinonaga teaches changing a wavelength when changing the pattern of the mask.

Regarding claim 30, according to MPEP 2114, while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

Art Unit: 2851

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter B. Kim whose telephone number is (571) 272-2120. The examiner can normally be reached on 8:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Peter B. Kim  
Primary Examiner  
Art Unit 2851

August 5, 2005